

1

2 **CLAIMS**

3

4 1. An implantable cardiac therapy device comprising:
5 cardiac therapy circuitry configured to perform at least one of (1)
6 monitoring cardiac activity or (2) administering stimulation therapy;
7 communication circuitry to enable high frequency communication; and
8 a casing to house both the cardiac therapy circuitry and the communication
9 circuitry, while isolating the communication circuitry from the cardiac therapy
10 circuitry.

11

12 2. An implantable cardiac therapy device as recited in claim 1, wherein
13 the communication circuitry comprises an RF transceiver.

14

15 3. An implantable cardiac therapy device as recited in claim 1, wherein
16 the casing comprises:
17 a first chamber to house the cardiac therapy circuitry; and
18 a second chamber to house the communication circuitry.

19

20 4. An implantable cardiac therapy device as recited in claim 1, further
21 comprising an antenna, the communication circuitry being connected to send and
22 receive signals via the antenna.

5. An implantable cardiac therapy device as recited in claim 4, wherein the antenna is integrated into the casing.

6. An implantable cardiac therapy device as recited in claim 4, wherein the casing has a header to which conductive leads can be connected, the antenna residing in the header of the casing.

7. An implantable cardiac therapy device as recited in claim 1, wherein the casing has a header to which conductive leads can be connected, and the communication circuitry comprises:

an RF transceiver to transmit and receive RF signals; and

a diplexer coupled to receive high-frequency signals and low-frequency signals from the leads and to split the high-frequency signals from the low-frequency signals, the diplexer passing the high-frequency signals to the RF transceiver and the low-frequency signals to the cardiac therapy circuitry.

8. An implantable cardiac therapy device as recited in claim 7, wherein the casing comprises:

a first chamber to house the cardiac therapy circuitry;
a second chamber to house the RF transceiver and the diplexer; and
a filtered feed-through to pass low-frequency signals from the second
chamber into the first chamber.

9. A cardiac network system comprising:

the implantable cardiac therapy device as recited in claim 1; and

1 a computing network to link one or more computing systems to the
2 implantable cardiac therapy device.

3
4 **10.** An implantable cardiac therapy device comprising:
5 an encasing constructed to define first and second chambers in frequency
6 isolation from one another;

7 the first chamber housing first circuitry to handle low-frequency signals;
8 and

9 the second chamber housing second circuitry to handle high-frequency
10 signals.

11
12 **11.** An implantable cardiac therapy device as recited in claim 10,
13 wherein the first chamber is adjacent to the second chamber.

14
15 **12.** An implantable cardiac therapy device as recited in claim 10,
16 wherein the second chamber is encompassed within the first chamber.

17
18 **13.** An implantable cardiac therapy device as recited in claim 10,
19 wherein the encasing further comprises a header to which conductive leads can be
20 connected, the second chamber being positioned adjacent to the header so that at
21 least the high-frequency signals can be passed directly from the header to the
22 second chamber.

1 **14.** An implantable cardiac therapy device as recited in claim 10,
2 wherein the encasing further comprises a header to which conductive leads can be
3 connected, the second chamber being located within the header.

4

5 **15.** An implantable cardiac therapy device as recited in claim 10, further
6 comprising a filtered feed-through to conduct the low-frequency signals from the
7 first chamber to the second chamber while blocking the high-frequency signals.

8

9 **16.** An implantable cardiac therapy device as recited in claim 10,
10 wherein the first circuitry comprises cardiac sensing and stimulation circuitry.

11

12 **17.** An implantable cardiac therapy device as recited in claim 10,
13 wherein the second circuitry comprises an RF transceiver.

14

15 **18.** A cardiac network system comprising:
16 the implantable cardiac therapy device as recited in claim 10; and
17 a computing network to link one or more computing systems to the
18 implantable cardiac therapy device.

19

20 **19.** An implantable cardiac therapy device comprising:
21 a first can to house cardiac therapy circuitry; and
22 a second can to house a high-frequency transceiver; and
23 the first and second cans being configured to permit electrical
24 communication between the high-frequency transceiver and the cardiac therapy

1 circuitry while preventing high-frequency signals emanated in the second can from
2 interfering with the cardiac therapy circuitry in the first can.

3

4 **20.** An implantable cardiac therapy device as recited in claim 19,
5 wherein the first and second cans share one or more common walls.

6

7 **21.** An implantable cardiac therapy device as recited in claim 19,
8 wherein one of the first and second cans encompasses the other of the first and
9 second cans.

10

11 **22.** An implantable cardiac therapy device as recited in claim 19,
12 wherein the first and second cans are integrated as a single housing.

13

14 **23.** An implantable cardiac therapy device as recited in claim 19, further
15 comprising a feed-through to pass data received by the high-frequency transceiver
16 from the second can to the cardiac therapy circuitry in the first can.

17

18 **24.** An implantable cardiac therapy device as recited in claim 19,
19 wherein the high-frequency signals are received by leads configured to be attached
20 to a patient's heart, the implantable cardiac therapy device further comprising a
21 circuit to separate the high-frequency signals from cardiac signals conducted by
22 the leads.

1 **25.** An implantable cardiac therapy device as recited in claim 19, further
2 comprising an antenna to receive the high-frequency signals.

3

4 **26.** A cardiac network system comprising:
5 the implantable cardiac therapy device as recited in claim 19; and
6 a computing network to link one or more computing systems to the
7 implantable cardiac therapy device.

8

9 **27.** An implantable cardiac therapy device comprising:
10 a header to facilitate connection to one or more conductive leads;
11 a diplexer coupled to the header to enable electrical communication with
12 the conductive leads, the diplexer separating high-frequency signals from low-
13 frequency signals received from the conductive leads;
14 cardiac therapy circuitry resident in an EMI-resistant chamber and coupled
15 to receive the low-frequency signals from the diplexer; and
16 RF circuitry isolated from the cardiac therapy circuitry and coupled to
17 receive the high-frequency signals from the diplexer.

18

19 **28.** An implantable cardiac therapy device as recited in claim 27,
20 wherein the diplexer and the RF circuitry reside in a high-frequency chamber that
21 is separate from the EMI-resistant chamber.

1 **29.** An implantable cardiac therapy device as recited in claim 27,
2 wherein the diplexer, the RF circuitry, and the cardiac therapy circuitry are
3 integrated as a single device.

4

5 **30.** An implantable cardiac therapy device as recited in claim 27, further
6 comprising a feed-through into the EMI-resistant chamber to the low-frequency
7 signals.

8

9 **31.** An implantable cardiac therapy device as recited in claim 27, further
10 comprising a feed-through into the EMI-resistant chamber to pass data output by
11 the RF circuitry to the cardiac therapy circuitry.

12

13 **32.** An implantable cardiac therapy device as recited in claim 27, further
14 comprising:

15 a first feed-through to pass the signals from the conductive leads to the
16 diplexer; and

17 a second feed-through to pass low-frequency signals from the diplexer to
18 the cardiac therapy circuitry.

19

20 **33.** A cardiac network system comprising:
21 the implantable cardiac therapy device as recited in claim 27; and
22 a computing network to link one or more computing systems to the
23 implantable cardiac therapy device.

1 **34.** An implantable cardiac therapy device comprising:
2 cardiac therapy circuitry;
3 RF circuitry; and
4 a housing comprising:
5 a header to facilitate connection to one or more conductive
6 leads;
7 a high-frequency chamber to house the RF circuitry;
8 a first conductive feed-through to electrically connect the
9 header with the RF circuitry in the high-frequency chamber;
10 a low-frequency chamber to house the cardiac therapy
11 circuitry; and
12 a second conductive feed-through to electrically connect
13 one of the header or the RF circuitry with the cardiac therapy
14 circuitry in the low-frequency chamber.

15
16 **35.** An implantable cardiac therapy device as recited in claim 34,
17 wherein the high-frequency chamber resides in the header.

18
19 **36.** An implantable cardiac therapy device as recited in claim 34,
20 wherein the high-frequency chamber and the low-frequency chamber are separate
21 from the header.

1 **37.** An implantable cardiac therapy device as recited in claim 34,
2 wherein one of the high-frequency chamber and the low-frequency chamber is
3 encompassed within the other of the high-frequency chamber and the low-
4 frequency chamber.

5

6 **38.** An implantable cardiac therapy device as recited in claim 34,
7 wherein the second conductive feed-through comprises a filter to remove high-
8 frequencies.

9

10 **39.** An implantable cardiac therapy device as recited in claim 34,
11 wherein the high-frequency signals are received by leads configured to be attached
12 to a patient's heart, the RF circuitry comprising a circuit to separate high-
13 frequency signals from cardiac signals conducted by the leads.

14

15 **40.** An implantable cardiac therapy device as recited in claim 34, further
16 comprising an antenna to receive high-frequency signals.

17

18 **41.** A cardiac network system comprising:
19 the implantable cardiac therapy device as recited in claim 34; and
20 a computing network to link one or more computing systems to the
21 implantable cardiac therapy device.

22

23 **42.** An implantable cardiac therapy device, comprising:
24 cardiac management means for managing cardiac activity;

1 communication means for communicating with external devices using high-
2 frequency signals; and

3 casing means for holding the cardiac management means and the
4 communication means in frequency isolation from one another so that high-
5 frequency signals from the communication means do not interfere with the cardiac
6 management means.

7
8 **43.** The implantable cardiac therapy device of claim 42, wherein the
9 communication means comprises an RF transceiver.

10
11 **44.** The implantable cardiac therapy device of claim 42, wherein the
12 casing means comprises:

13 a first can to hold the cardiac management means; and
14 a second can to hold the communication means.

15
16 **45.** The implantable cardiac therapy device of claim 42, wherein the
17 casing means comprises a housing configured with first and second chambers, the
18 first chamber being sized to contain the cardiac management means and the
19 second chamber being sized to contain the communication means.

20
21 **46.** The implantable cardiac therapy device of claim 42, further
22 comprising signal separation means for separating the high-frequency signals from
23 low-frequency signals received on conductive leads adapted for connection to a
24 heart.

1 **47.** A cardiac network system comprising:
2 the implantable cardiac therapy device as recited in claim 42; and
3 a computing network to link one or more computing systems to the
4 implantable cardiac therapy device.

5

6 **48.** A cardiac therapy system comprising:
7 an implantable cardiac therapy device equipped with a high-frequency
8 transceiver in frequency isolation from cardiac therapy circuitry; and
9 a programmer to communicate with the implantable cardiac therapy device
10 via high-frequency signals.

11

12 **49.** A cardiac therapy system as recited in claim 48, wherein the cardiac
13 therapy circuitry comprises a cardiac stimulation device.

14

15 **50.** A cardiac therapy system as recited in claim 48, wherein the high-
16 frequency transceiver comprises an RF transceiver.

17

18 **51.** A cardiac therapy system as recited in claim 48, further comprising
19 a local transceiver separate from, but in proximity to, the implantable cardiac
20 therapy device and configured to reside externally of a patient, the programmer
21 being configured to communicate with the implantable cardiac therapy device via
22 the local transceiver.

1 **52.** A cardiac therapy system as recited in claim 48, wherein the
2 implantable cardiac therapy device comprises an encasing constructed to define
3 first and second chambers in frequency isolation from one another, the first
4 chamber housing the cardiac therapy circuitry and the second chamber housing the
5 high-frequency transceiver.

6

7 **53.** A cardiac network system comprising:
8 an implantable cardiac therapy device equipped with a high-frequency
9 transceiver in frequency isolation from cardiac therapy circuitry;
10 a computing network linking one or more computing systems that process
11 data received from the implantable cardiac therapy device; and
12 the implantable cardiac therapy device being configured to communicate
13 with the computing network using high-frequency signals.

14

15 **54.** A cardiac network system as recited in claim 53, wherein the cardiac
16 therapy circuitry comprises a cardiac stimulation device.

17

18 **55.** A cardiac network system as recited in claim 53, wherein the high-
19 frequency transceiver comprises an RF transceiver.

1 **56.** A cardiac network system as recited in claim 53, further comprising
2 a local transceiver separate from, but in proximity to, the implantable cardiac
3 therapy device and configured to reside external of a patient, the local transceiver
4 being configured to communicate with the high-frequency transceiver of the
5 implantable cardiac therapy device.

6

7 **57.** A cardiac network system as recited in claim 53, further comprising
8 a computing system that analyzes the data and derives instructions used to
9 program operation of the implantable cardiac therapy device, the computing
10 network being configured to transfer the instructions from the computing system
11 to the implantable cardiac therapy device.

12

13 **58.** A cardiac network system as recited in claim 53, wherein the
14 implantable cardiac therapy device comprises an encasing constructed to define
15 first and second chambers in frequency isolation from one another, the first
16 chamber housing the cardiac therapy circuitry and the second chamber housing the
17 high-frequency transceiver.

18

19 **59.** A method comprising:
20 receiving both high-frequency and low-frequency signals at an implantable
21 cardiac therapy device; and

22 passing the high-frequency signals to first circuitry in a first isolated region
23 of the implantable cardiac therapy device and the low-frequency signals to second
24 circuitry in a second isolated region of the implantable cardiac therapy device.

1 **60.** A method as recited in claim 59, wherein the receiving comprises
2 receiving the high-frequency and low-frequency signals from conductive leads
3 adapted to be mounted to a patient's heart.

4

5 **61.** A method as recited in claim 60, further comprising separating the
6 high-frequency signals from the low-frequency signals.

7

8 **62.** A method as recited in claim 59, wherein the receiving comprises:
9 receiving the low-frequency signals from conductive leads adapted to be
10 mounted to a patient's heart; and
11 receiving the high-frequency signals from an antenna.

12

13 **63.** A method as recited in claim 59, wherein the passing comprises
14 transferring the low-frequency signals through the first isolated region and then to
15 the second isolated region.

16

17 **64.** A method as recited in claim 59, further comprising preventing the
18 high-frequency signals from entering the second isolated circuitry.